means include nanoscale chemistry and biochemistry microarrays known in the field and currently commercially available. Such arrays may also be used to monitor the presence and/or absence of nutrients and other additives in the purified product, as discussed above.

9. Remote Monitoring of Entire System

[0704] In various embodiments it may be possible to remotely monitor and control the vending apparatus. It may be possible to remotely monitor the power source, which, in some embodiments, may be a Stirling cycle generator, and the vending device. In some embodiments, the remote monitoring system may track vending information such as, but not limited to, a usage profile, the amount of water dispensed daily, the nutraceuticals and/or flavorings and/or other additives dispensed; if the water runs out or if it remains full at the end of the day, information about system errors or out of specification performance of the system, etc. This information may be used to remotely change the production rate of the vending apparatus and/or the supply of nutraceuticals and/or flavoring and/or other additives, as to accommodate the water usage in the area. In some embodiments, if the vending apparatus uses an alternate power source as a primary power source and has a Stirling cycle generator as an alternate source, if the primary power source terminates, the monitoring system may send a signal to remotely begin the Stirling generator to continue to produce water through the vending machine. Alternately, if the Stirling cycle generator is the primary power source and the user has not paid for use of the vending apparatus for an extended time, a signal may be sent to turn off the Stirling cycle generator and end production of water until the user pays for the service.

[0705] Using the remote monitoring system, blowdown flow rate, water consumption, production and efficiency may be monitored as well. In some embodiments, after monitoring the blowdown and production conductivities, the data may show the blowdown is larger than necessary and may decrease the amount of blowdown from the device therefore decreasing the amount of source water used through this remote monitoring system. The system may also monitor the information about forming the vessels if the embodiment implementing the bottle forming process along with the remote monitoring of the system.

[0706] When a vending apparatus includes additives and mixing chambers, the additives may need to be monitored to inform users if the additives need replacement. This remote monitoring system may monitor additive levels and inform users prior to complete depletion of the additive that the additive needs replacement.

[0707] The remote monitoring may send signals on general health of the apparatus, such as the temperature of the purification system, the pressure used in purification, the power used in the device, quality of product water, flow rate, etc.

10. Remote Monitoring System

[0708] The various embodiments of the water vapor distillation apparatus described above may, in some embodiment, contain a monitoring system for distributed utilities (also may be referred to as a remote monitoring system). In the exemplary embodiment, the remote monitoring system is a monitoring system described in pending U.S. Patent Application Pub. No. US 2007/0112530 published May 17, 2007 entitled "Systems and Methods for Distributed Utilities," the contents of which are hereby incorporated by reference herein.

10.1 Monitoring

[0709] Referring first to FIG. **29**, preferred embodiments provide for monitoring generation device **10**. Generation device **10** may be any distributed utility generation device, such as a water purification system, an electrical generator, or other utility generation device, or a combination of these. Generation device **10** may typically be characterized by a set of parameters that describe its current operating status and conditions. Such parameters may include, without limitation, its temperature, its input or output flux, etc., and may be subject to monitoring by means of sensors, as described in detail below.

[0710] In the case in which generation device **10** is a water purification device, source water enters the generation device **10** at inlet **22** and leaves the generation device at outlet **12**. The amount of source water **25** entering generation device **10** and the amount of purified water **13** leaving generation device **10** may be monitored through the use of one or more of a variety of sensors commonly used to determine flow rate, such as sensors for determining them temperature and pressure or a rotometer, located at inlet sensor module **21** and/or at outlet sensor module **11**, either on a per event or cumulative basis. Additionally, the proper functioning of the generation device **10** may be determined by measuring the turpidity, conductivity, and/or temperature at the outlet sensor module **11** and/or the inlet sensor module **21**. Other parameters, such as system usage time or power consumption, either per event or cumulatively, may also be determined. A sensor may be coupled to an alarm or shut off switch that may be triggered when the sensor detects a value outside a pre-programmed range.

[0711] When the location of the system is known, either through direct input of the system location or by the use of a GPS location detector, additional water quality tests may be run based on location, including checks for known local water contaminates, utilizing a variety of detectors, such as antibody chip detectors or cell-based detectors. The water quality sensors may detect an amount of contaminates in water. The sensors may be programmed to sound an alarm if the water quality value rises above a pre-programmed water quality value. The water quality value is the measured amount of contaminates in the water. Alternatively, a shut off switch may turn off the generation device if the water quality value rises about a pre-programmed water quality value.

[0712] Further, scale build-up in the generation device **10**, if any, may be determined by a variety of methods, including monitoring the heat transfer properties of the system or measuring the flow impedance. A variety of other sensors may be used to monitor a variety of other system parameters.

[0713] In the case in which generation device **10** is an electrical generator, either alone or in combination with a water purification device or other device, fuel enters the generation device from a tank, pipe, or other means through fuel inlet **24**. The amount of fuel consumed by generation device **10** may be determined through the use of a fuel sensor **23**, such as a flow sensor. Electricity generated, or in the case of a combined electrical generator and water purification device, excess electricity generated may be accessed through electricity outlet **15**. The amount of elec-